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Composition, structure, and anisotropy of magnetic properties of d- and dℝ-tartrates of Dy3+ from proton magnetic relaxation and magnetic birefringence data

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Abstract

We have determined the composition and stability of d- and dℝ-tartrates of Dy3+. In the pH region 4.0-7.0, we have shown that binuclear particles are formed. The relative stability of isomeric d- and dℝ-tartrates of Dy3+ is determined only by the statistical factor. From data on the paramagnetic birefringence effect, binuclear d- and dℝ-tartrates of dysprosium(III) have a polycyclic structure including six five-membered metallocycles, two of which are condensed with the central twelve-membered ring. The paramagnetic anisotropy of Dy3+ in the studied dimers has twice the absolute value of the anisotropy of the aqua ion of Dy3+ (Δk=-2860·10-29 cm3). Using the magnetic susceptibility measurements, we have demonstrated the virtually complete absence of Dy3+-Dy3+ magnetic interactions in binuclear d- and dℝ-tartrates. © 1990 Plenum Publishing Corporation.

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